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NOTICES.

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NOTES.

Works on Photography, etc.—At the Patent Office Library and Reading Room, Chancery Lane, there are some 557 works on subjects pertaining to photography, lanterns, etc., which may be consulted without "red tape." The reading room, which is open free every day, contains a vast collection of text books upon every subject and also periodical literature.

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Flat P.O.P. Prints.—A Glasgow contemporary asks what can be more annoying than to have a number of P.O.P. prints placed before one to examine, each rolled up, little larger than a lead pencil, and obstinately refusing to uncurl. It may not be generally known that the addition of a very little glycerine to the last washing water of the prints will make them lay flat when dry, just as it does with rollable films.

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Waste Calcium Carbide.—It is a well-known fact that in all carbide works a vast amount of material is manufactured that is of such inferior quality that it cannot be employed in connection with acetylene, and so far has been regarded as waste. Now, however, a French engineer, M. Hubou, has invented a process by which he can convert this unsaleable material into a commercial article in the form of acetylene black. When acetylene is decomposed the carbon is liberated in an absolutely pure and finely-divided state. It is immeasurably superior to lampblack, and would prove a valuable substitute for that substance in the manufacture of lithographic ink were it not for the fact that it is so exceedingly expensive that it would not pay for its manufacture. M. Hubou, by his new process, says the *Scientific American*, is able to convert the carbide residue into the black at a very small cost, so that it can compete in price with the ordinary lampblack. His process is simplicity itself. The acetylene is forced into an explosive vessel, filled with hydrogen, until a pressure of about 75 lbs. is attained. The substance is then exploded by firing a coil of platinum wire, that has been previously inserted into the vessel, to a white heat. Owing to the presence of the hydrogen in the receptacle the heat generated by the acetylene in the process of decomposition is reduced, so that the highest pressure recorded during the explosion is no more than 370 lbs. per square inch. One cubic foot of acetylene yields 1 oz. of black, while also a cubic foot of pure hydrogen is produced. There is no reason why the latter article should not also be turned to commercial account.

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A Perth Photographic Business.—Messrs. Rae Brothers, of Glasgow, inform us that they have recently acquired the old-established photographic and lantern business of George Grieve, 29, Scott Street, Perth, and that Mr. Grieve is to be retained as manager of this branch business.

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To Photographic Societies. — Kodak, Limited, are now arranging with secretaries of Photographic Societies, to give demonstrations during the winter months on Development of Rollable Films, Dekko Paper Demonstrations, Panoram Photography, illustrated with examples.

◆ ◆ ◆

Purifying Acetylene Gas.—In Hungary, chloride of lime alone was formerly used for purifying acetylene gas, but owing to the liberation of chlorine was liable to cause an explosion. Latterly, chloride of lime together with sodium plumbate containing an excess of alkali has been employed with marked improvement.

Which Acetylene Generator shall I Buy?

By **R. J. MOSS**, Birmingham.

Continued from page 104.

SOME users stipulate that the light must be turned on or off at will without any escape of gas; at least two firms have made this feature their special study. The object is attained by dividing the charge into several small sections or by less division, but complete isolation of each. In either case the apparatus works at a low pressure, the water inlet is small, and the whole arrangements are carefully balanced for a certain work. It must be apparent that if the pressure is increased, then more than the calculated quantity of carbide will be damped, and the aftermake of gas will be greater than the holder will contain. A similar result will take place if more than the proper number of burners are used, even supposing the water will run fast enough to supply them properly. They will, of course, work well with a smaller number, and be equally under perfect control. To ensure this slow and steady generation with the certainty that it can be turned out and used again as often as required, we have to put up with **low pressure,** only moderate light and the additional trouble of filling and cleaning out a number of small carbide chambers, together with the extra cost of these additional arrangements.

The same results are also obtained by another system, viz., allowing granulated carbide to fall into water. These generators can have no aftermake, and consequently the gas may be turned off at any time. They are also very easily emptied, but defects must of necessity be present—to wit, the difficulty of ensuring the correct granulation of carbide, the certainty that the generated steam and moisture will decompose the smaller particles of carbide at the outlet of hopper, and interfere with the free action of the valve or plunger; while the naturally moist gas has a great tendency to impair the light and choke the burners, to say nothing about irregular pressure and varying light. But, as already insisted on, every advantage has its counterpart in some way. The remaining six customers appear to be more exacting in their demands, and by this time the choice of generators is considerably reduced; still, as they do not hamper you with restrictions, the task of supplying their wants is much more easy than at first sight seems possible.

7. This one wants an effective apparatus, irrespective of size or weight, and without special features; but before we can satisfy him, we must decide as to what is an effective apparatus?

In my opinion the lowest standard of an effective apparatus should embrace the following points:—(*a*) That it can be charged some short time before the entertainment is due to commence, will allow of the focus and distance being arranged, and the lights afterwards turned down until all is ready without any gas escaping; (*b*) that it so controls the production of gas that none will escape during use; (*c*) in which such arrangements are made to arrest condensation that no moisture can stop up the gas passage during an exhibition, and I should like to add—though it is almost too much to expect from a moderate priced generator—in which the gas is so cooled and dried that the burners will run for at least two hours

without any alteration

to the perfect shape of the flames or diminution in the brilliancy of the light.

I would most strongly insist that this result cannot be obtained by a very small or cheap apparatus, but otherwise there is no difficulty in finding what No. 7 requires.

8. A fairly steady light may be ensured either by a rising and falling bell, even if the carbide be all in one chamber, provided that no great quantity of residue can escape; by the same system to a greater extent if the carbide is subdivided and the water flows into or rises up to it, but very slowly; or by a displacement system in which the water flows continuously into a series of small carbide chambers.

9. While a steady light can be obtained at almost any reasonable pressure, the bright light needs a much higher one than is generally recognised as the best, but in addition, a careful arrangement of cooling pipes and condensing chambers to thoroughly cool and dry the gas is absolutely essential to obtain a good bright light. It will readily be admitted that these additions must mean increased cost, besides more trouble in cleaning out the apparatus.

10. Easy and rapid re-charging is another luxury, yet it is one that most expert lanternists like to have under their control, should occasion arise; but such a convenience can only be secured by the addition of an entirely separate carbide chamber, either inside or outside the main body of the generator. I only know of one apparatus provided with such an arrangement and suitable for lantern work, though one or two others are on the road; luxuries have generally to be paid for, so must this.

11. To be able to tell at a glance how much longer the generator is likely to run is a considerable advantage, but this is only possible with a continuous working apparatus of which there are at least two varieties, or with a displacement machine having an outside carbide holder, fitted with steam gauge indicator, though I venture to think that few people would care to use the latter for portable work. A continuous action machine may not add seriously to the expense, but as the carbide must be subdivided, it means additional trouble.

12. My last customer wants perfection, but as he does not mind a fair price, moderate sized apparatus, and a reasonable amount of trouble, we shall have little trouble in supplying his needs. To my mind such an apparatus should not only possess the essential features previously set forth, but also those asked for in 8, 9, 10, and 11; but this combination would necessitate improved construction, added parts, and a somewhat larger sized water tank, etc., than those generally sold. I will candidly admit that no generator as now offered quite reaches my standard, yet many of the best would—when used with smaller charges, say 1 lb. instead of 1½ lbs. or 2 lbs.—give excellent results; and if a small effective purifier were added, there would be no doubt that a

perfect light

and freedom from smell in burning would be obtained. I know of one operator (a lady) who will have perfection—weight, size and price count for nothing—and by following out the above idea in toto, declares herself perfectly satisfied that she has secured it.

I think, from what I have already written, that it will be clear to the most casual reader that the ideal of most persons is unattainable. It is impossible to fit a cheap or small generator with the additional parts necessary to produce perfect gas and complete automatic control; nor can those features requisite for best results be included without some additional trouble in use and so on. My advice to intending users of acetylene is this, first of all decide whether you will have all possible advantages, in which case consult an experienced dealer or manufacturer, but carefully insist on the particular features indicated. If, however, pocket, portability, or some other reason necessitates a modification, then select the generator most suitable to your requirements, or else go direct to a dealer, tell him what you want, and insist on him procuring such an apparatus, and that only. Any intelligent student of the acetylene market will have no difficulty in supplying your wants. I could, of course, select a few generators as typical of each class, but such a course would scarcely be fair, even if the editor would allow it, so I must leave the choice to my readers' judgment or to the "Notes and Queries" column.

Tone Values in Lantern Slides.

By GEORGE E. BROWN, F.I.C.

THIS is a subject to which too little attention is given. Professional lantern slide makers are greater sinners in this respect than amateurs, to whom is due whatever position the lantern slide has gained as a mode of pictorial expression. The composition of the picture may be good, and the colour of the image suitable to it, but if the tones are wrong or unpleasing, the slide fails to satisfy anyone with any capacity to distinguish between what is beautiful and what is not. No doubt there are many people who cannot do this, and no doubt they are good customers of the slide makers. But it does not follow that for this reason we should go on making slides bad or false in tone. For many years an audience demanded coloured slides for lectures interspersed with dioramic effects. The taste for these has in many quarters been supplanted by the capacity to enjoy well made monochrome photographic slides, and this appreciation will be more widely manifested as slide makers produce transparencies on which care has been bestowed in obtaining the most harmonious range of tones.

There are technical reasons why the slide maker of all photographers ought to seize hold of any advantage in this direction. The processes used in slide making, from the very fact that the slides are viewed by transmitted and not by reflected light, give a wider range of tones than do processes on paper or other opaque supports, in which the picture is viewed by reflected light. Then there are many processes by which the slide maker can alter the tone values to his liking much more easily than can be done in printing on paper. There are difficulties, of course; the question of illumination is one. Slides that are projected with a certain illumination per unit area naturally exhibit a different effect when shown with one four times or one quarter this.

It is impossible to say here what in general are correct tone values. Everything depends on the scale of tones in the original, or on the effect which the photographer seeks to produce. The slide maker who desires to represent Nature as something different from the black and white monstrosities which are so often applauded as the *summum bonum* of good slide making, will find plenty of information in the writings and examples of leaders in pictorial photography. Enough that here I outline some of the methods applicable to this purpose.

Mr. Alfred Stieglitz, of New York, was one of the first to direct attention to the means at the disposal of the lanternist for modifying the tones of the slide. His method as described before the New York Camera Club is as follows:—

The slide is developed exactly in the ordinary way (with the usual developer), except that development is continued until the image has totally disappeared when examining the plate by transmitted light. It is then rinsed under the tap as usual, and fixed in the usual hypo bath. If it be examined at this stage, it should appear so thick as to be scarcely recognisable, and should possess (apparently) no gradation. A weak solution of Farmer's reducer (ferricyanide and hypo) is now mixed, and the slide placed in it directly from the fixing bath. The reduction should be quite gradual. As soon as the image is fairly distinct, but still

far too dense,

the process is stopped, and the slide placed in clean water. It is now ready for local treatment, which is done with weak Farmer's reducer, applied with a small camel's hair brush or tuft of cotton wool. Between every stroke or two of the brush it is well to rinse the plate, so that the strokes do not show the ultimate result.

In winter the gelatine is quite able to withstand this rough treatment, but in summer a very weak solution of formalin (1 part formalin in 1,000 parts of water) had better be used. This is applied for a few minutes before brush reduction is commenced, the slide being afterwards well rinsed. Sometimes the colour of the reduced slide is not very pleasing, in which case the slide should be toned. A suitable bath is:—

(1)	Ammonium sulphocyanide	20 grains.
	Carbonate of soda	2 grains.
	Water	32 ounces.
(2)	Chloride of gold (brown)	15 grains.
	Water	1 ounce.

Use 2 ounces of No. 1 and add to it (not *vice versâ*) 4 drops of No. 2. This amount will tone

one slide to a perfect blue, or a larger number to a bluish tint. It must be used at 72 degrees Fahr. to 76 degrees Fahr.

Before leaving these directions of Mr. Stieglitz, it may be well to recall to the reader the beautiful examples of its use exhibited by him at the Royal Photographic Society's Exhibition of a few years ago.

A second method of altering tone values works in one direction only, viz., in softening down patches of light in the slide, which though unobjectionable on the small scale, become glaring toneless regions when the slide is projected. This method is scarcely recent, but has gained prominence from Mr. Stieglitz's advocacy. Some of the first examples of its use were shown by Mr. John Beeby of New York.

The slide, having been completed exactly in the usual way, is placed face up in a printing frame, and a second lantern plate laid over it, the mask with which the slide is to be bound intervening. The back of the frame is put in, and a short exposure to light given. The result is a delicate negative impression of the image. This secondary slide must be kept very thin. It is finished as usual, and bound up in coincidence with the transparency just made. If the effect on the screen is too pronounced, the negative slide is removed and reduced, either wholly or locally. This is a method which calls for very little manipulative skill, but the results of which are well worth the extra trouble and expense demanded. It has proved itself of especial value in the case of scenes of wet streets, etc., where a too brilliant sky spoils the rainy effect. It is, too, a

convenient substitute

for printing in clouds; the plain sky produced in this way being, at any rate, less objectionable, because more true to Nature than the dazzling white so frequently seen.

A further adaptation of it is to make the secondary slide in a striking warm colour. Some years ago Mr. Paul Lange made some effective projections in this way. The subjects were the interior of a church with the windows illuminated by the setting sun, the sun setting behind trees, etc. The warm tone was produced in his case, I believe, by using chloride plates; but it might also be done by substitution toning, say with Ferguson's copper ferricyanide in citrate solution.

Other minor methods of altering tone values, such as by halogen toning, etc., are probably known to the reader, as they have been described in these columns.

How to Mount Snapshot Lenses.

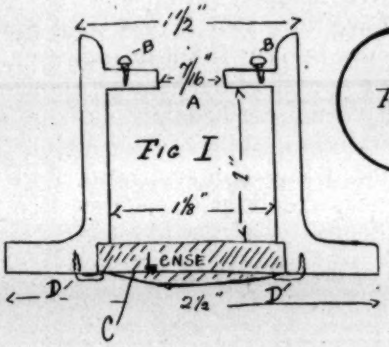
By H. H. WARD.

TWO $\frac{1}{4}$-plate Jena lenses (single) came into my possession some time ago. They were unmounted, but a little experimenting with them convinced me of their fine qualities for landscape work. The definition was grand, even to the corners of the plate, so I thought they would repay the trouble of mounting. This at first proved a somewhat perplexing task, but it was managed in the following way.

I found that each lens, which was 5 inch focus, was $1\frac{1}{4}$ inch in diameter and $\frac{3}{16}$ of an inch thick.

Though I did not calculate the distance at all, I decided to put the diaphragm about 1 inch in front of the lenses, and this proved correct.

Then I found that the loose front of my camera, which is round, was $2\frac{1}{2}$ inches in diameter, so I decided to combine the lens mount and front by making the flange of the lens the full width and just the same thickness as the ordinary loose front. Then I got a wood-turner to make two mounts as shown in half section in the sketch (Fig. I.). The measurements given were carefully adhered to by him, but he did not make the hole in the diaphragm A (Fig. I.), which I bored very carefully afterwards. This hole is $\frac{7}{16}$ of an inch in diameter, which is almost equal to $\frac{f}{11}$, though for some subjects a slightly larger stop might be used. To get the diameter exact, I cut a strip off a visiting card just wide enough and tested it from time to time during boring.



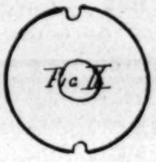


Fig. II. shows the form of stop I use for smaller apertures. Two small pieces were cut out opposite each other to just pass under the screw heads B (Fig. I.), so that a very slight turn will hold them secure. These stops were cut from thin brass and blackened. They work well.

The mounts were turned in mahogany so I dead blacked them inside, but only down to the flange outside, leaving the flange itself its natural colour and French polishing the whole of the outside.

The lenses themselves were now put into the recesses C (Fig. I.), which fitted them closely.

I then took four very fine brass screws about half an inch long and bent them into the form of a letter L, first filing the heads off and flattening both sides of the shanks. Two of these were screwed close down into the back of each flange as shown at D (Fig. I.) so as to project over the extreme edge of the lenses, yet enough to hold them in position. These can be turned out of the way, when the lenses may be removed for cleaning, etc.

If the loose front of the camera had been square or oblong, the flanges need not have been turned, but simply squared to the proper size, or a smaller flange could have been turned and the whole glued to the square front.

The mounts as described cost 1s. each, though had I possessed a lathe, a few minutes work would have made them for the cost of the wood, but I have now two lenses with mounts as light or even lighter than aluminium, yet capable of very accurate work, and apparently quite as strong and serviceable as the best. As they are perfectly matched, I am using them for a twin lens hand camera, and find the mounts and lenses excellent.

The Total Eclipse of the Sun (28th May, 1900), and its Photographic Results.

By W. H. GOLDING.

CONSIDERING that an eclipse of the sun occurs at least twice in every year, and that on many of these occasions, though by no means on all, the solar disc is totally concealed from view for a period varying from a few seconds to some six or seven minutes, but never longer, it seems at first sight strange that such a phenomenon has never been visible in the British Islands within the memory of anyone now living, nor is likely to be so for many years to come.

It will be found on further consideration, that the regions favoured by the appearance of such a sight can only be those situated within the bounds of a narrow strip of the earth's surface, seldom much exceeding a hundred miles in width, and frequently narrower, though it may extend in a more or less oblique direction for many thousand miles, crossing the ocean, often in very unfrequented parts of it, and traversing regions sometimes very difficult to reach, and affording few means of obtaining food, shelter, and other necessaries, to say nothing of the comforts of civilised life.

To these spots, whether situated in genial or in inhospitable climes, the astronomer who desires to observe the eclipse to any good purpose, must transport himself, his assistants, and his instruments, which are frequently extremely bulky and of great weight, always costly, and needing most careful and accurate adjustments, besides very considerable skill in their use, if the results are to be in any degree worthy of the labour and thought, to say nothing of the money expended upon them. And when these elaborate preparations have been made, and long and arduous journeys successfully accomplished, cloudy weather at the critical moment may render the entire undertaking fruitless, a fate which attended the efforts of nearly all the observers who visited Lapland, the northern island of Japan, and other remote regions of the Far North, in the

vain hope

of witnessing the eclipse of the 9th August, 1896, though at a few stations more favourable conditions prevailed. Better success attended the observers in Central India in 1898, and photography, whose applications are becoming more numerous and varied every year, proved a most valuable method of recording, for future careful and deliberate examination, the most important features of the phenomena presented to view during the brief and precious moments of the total phase.

The occurrence, on the 28th May last, of an eclipse which could be well observed in the southern part of the United States, in a path crossing Spain and Portugal, and in Northern Africa, promised an unusually favourable opportunity to European and American observers and to those whose scientific attainments and command of time and money did not warrant a long and costly journey to a remote and inconvenient part of the world. It was true that the eclipse would not last long; the sun was expected to be hidden from the view of the observers in the Peninsula and in Northern Africa for not more than 70 seconds (he actually reappeared some three or four seconds earlier), so that the most had to be made of the precious moments by those who wished to make any useful observations. Still the prospects were such as to attract several parties of observers from our own and other countries to the points from which the best view was likely to be obtained. The Astronomer-Royal, with a number of skilled assistants, had placed himself and the splendid instruments at his command at Ovar in Portugal; Sir Norman Lockyer and his party were stationed at Santa Pola in Spain; a large number of astronomers from various European countries, including Mr. Maunder of the British Astronomical Association, Mr. Wesley of the Royal Astronomical Society, and other skilful observers, witnessed the eclipse from Algiers, while farther east, at Tripoli, where the time of totality was still shorter, Professor Todd, of Amherst University, in the United States, had placed a magnificent collection of instruments, all regulated by a

current of electricity,

under the charge of himself and a party of able assistants. Numerous other positions were similarly occupied, and the weather at almost every station proved to be all that could be desired, cloudless skies prevailing nearly everywhere during the critical moments.

The circumstances under which this eclipse occurred presented some features of special interest; since it took place at a time when the disturbances which give rise to sun spots were at or very near their minimum, and it was desired to ascertain whether the appearances previously noticed at such periods would repeat themselves. Then the eclipse would be visible in the southern part of North America some hours before its occurrence in Southern Europe and Northern Africa, during which interval some important changes might possibly occur in the condition of the sun's surroundings, which would be apparent on comparing observations made at the various stations.

It will be recollected that an eclipse of the sun is due to the opaque body of the moon coming between us and our central luminary in the course of her monthly journey round the earth, and thus hiding the sun for a short time from the parts of the world on which her shadow falls. This would occur at every new moon were it not that our satellite's path through space carries her, in most instances, slightly above or below the sun's apparent position, so that were she visible at such a time she would appear to pass close to him without actually touching; the shadow which, like all opaque bodies, she projects into space, passing clear of the earth though very near to us. But at least twice in every year the moon occupies such a position that her shadow falls upon some part of the earth, and from that part the sun will appear to be wholly or partially eclipsed. Although the moon's size is insignificant compared with the enormous bulk of the sun, she is situated at such a distance from us as to appear of very nearly the same size, and hence is able to hide the great luminary from view when she passes directly between him and our earth. But owing to the elliptical orbits in which both the earth and the moon move, the distances and apparent sizes of these bodies vary within narrow limits, so that at one time the tapering shadow of the moon may terminate before reaching the earth, when an annular or ring-shaped eclipse will occur, the dark disc of the moon appearing to be surrounded by a ring of brilliant light; while at another time the earth will receive the shadow in the form of a circular spot, averaging perhaps a hundred miles in diameter, and travelling across a narrow strip of her surface at a speed of several hundred miles an hour as the moon proceeds in her eastward course round our globe. But as the earth is also rotating on her axis in the same direction, the time occupied by the moon's shadow in passing over any spot is somewhat lengthened, and it may traverse a

considerable distance

upon the surface of land and sea, and occupy several hours in doing so, before it finally quits our earth and passes once more into space. Thus, during the recent eclipse, the moon's shadow first touched the surface of the Pacific Ocean to the west of California, and after crossing to the coast of North Carolina and traversing the Atlantic Ocean, reached the western shores of Portugal two hours and a half after its first appearance, and finally quitted the earth's surface an hour or two later, near the shores of the Red Sea.

Apart from the accuracy with which these occurrences can be predicted, and the wonder, not unmixed with alarm, with which they have from time immemorial been regarded by the ignorant and superstitious, much interest attaches to them from the point of view of the ordinary spectator as well as of the scientific observer, because during the brief period of totality parts of the sun which are at other times hidden from us by the excessive brilliancy of his central disc, become visible, presenting an appearance of beauty and sublimity not readily forgotten by anyone who has had the opportunity of gazing upon it even for a few seconds, and, what is of even greater importance, revealing to the skilled astronomer secrets respecting the nature and condition of the sun which might remain for ever hidden were no such opportunity of penetrating into their mysteries afforded to him.

The parts of the sun thus presented to view are, first the chromosphere or luminous atmosphere, apparently consisting of vapours or gases in an intensely heated condition, amongst which the spectroscope enables the chemist to recognise metals and other substances familiar to us in a solid state, but apparently vapourised by the extremely high temperatures at which they exist in the sun; while in the opinion of Sir Norman Lockyer, and other eminent authorities, many substances which we have hitherto regarded as elementary, are probably resolved at those temperatures into yet simpler forms of matter. The chromosphere has long been observed to throw out into space what are known as prominences, which resemble tongues of flame, usually of a brilliant red colour, and appear to be ejected with force sufficient to carry them thousands of miles above the general level of the chromosphere, their forms undergoing constant change like the wreaths of smoke arising from a furnace, or the ever varying flame jets which play over the surface of burning fuel. The **chemical composition** of the vapours of glowing hydrogen and other substances of which these prominences appear to consist, can indeed be studied without waiting for an eclipse, but the prominences themselves can only be seen on such an occasion, and their appearance and varieties of form, height, and position are among the features for the observation of which the eclipse is eagerly anticipated and utilised to the fullest extent possible; and an accurate photographic record of these objects (which is far more reliable than any hasty drawings which can be made, or mental impressions which can be received by the observer, however experienced and self possessed, during the brief moments of their appearance) is of the utmost value, since it can be examined carefully and repeatedly long after the eclipse has passed away.

But perhaps the part of the sun which has during recent years attracted the most attention, and for the observation of which the eclipse is most eagerly anticipated, is the corona, the beautiful mysterious halo of pale silvery light which seems to surround the sun and to radiate from his central disc for thousands of miles, until it gradually fades away almost imperceptibly into the darkness of endless space; fades so gently and softly that it can hardly be said to have a distinct outline, and even practised eyes can scarcely discern its precise extent or the place of its ending. This is wholly hidden from our view excepting during the few moments of total eclipse, when it suddenly flashes out, like the halo round the head of a pictured saint, to the unbounded admiration of the beholder and the great alarm of the more ignorant and superstitious of mankind. The true nature and the varying forms of this most beautiful and mysterious of the solar appendages have given rise to innumerable speculations, and may be considered as the leading problem in solar physics at the present time. Observations by the eye, however well trained, seem to give impressions rather than definite details of form and appearance, and probably no two eyes see it precisely alike, or no two minds receive exactly the same impression, however closely they may agree as to the leading features of the marvellous display.

Hence the extreme value of photographic records, available for prolonged and leisurely examination, and unaffected by the personal equation and mental constitution of the individual observer, whose feelings and emotions cannot always be wholly suppressed or laid aside during the short opportunity afforded for his observations.

(*To be continued.*)

THE subject of the present mechanical silhouette slide is one that will appeal to all classes, both young and old, for we are all, more or less, interested in and fascinated by an exhibition of conjuring and sleight-of-hand tricks.

Moreover, though a glance at the accompanying diagrams might not lead him to think so, yet the reader will find that the construction of this slide is comparatively simple. It will, of course, be made more complicated according as the number of effects desired to be produced is increased.

The ordinary framework is employed, and part of the fittings are attached to a fixed glass. The other parts are fixed to the interior of the framework.

The reader's attention is now directed to Fig. I.

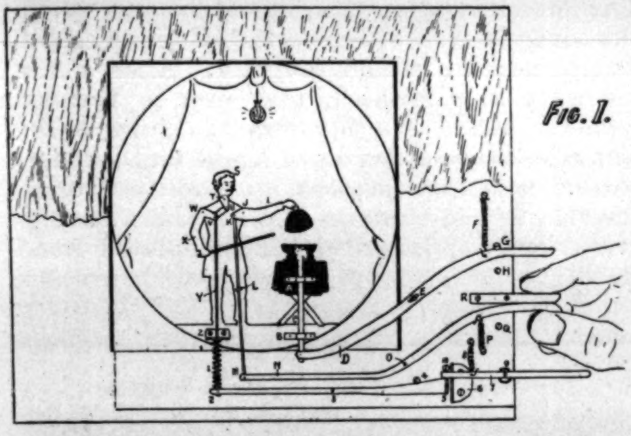


Fig. I.

The conjuror's trunk or body, with a base attached, is cut out of thin wood, and glued to the surface of the fixed glass. Most of the other parts are made of thin metal. The head, S, is, however, cut out of celluloid, and is pivoted to the body at T, and to a small connecting link at U. The features are painted on it. The link, which is not connected with the body, is pivoted to the arm X, and to the rod Y at the same point, namely V.

The arm X, holding the indispensable magic wand, is also pivoted to the body at W. The left arm I, holding the cover of the dish, is pivoted by a stationary pivot to the body at J, and to the other long rod at K.

The rod Y passes through the guiding plate Z, screwed to the base of the conjuror, and is pivoted at 2 to a long horizontal beam pivoted to the framework at 3, the end of which is bent up at right angles at 5. The edge is then cut so that a slope is formed.

1 is a spiral spring, the purpose of which will be seen presently. An enlarged drawing of the guiding plate Z is shown in Fig. II.; 4 is a screw that serves to limit the play of the beam with which it is shown in contact; 6 is a peculiarly shaped plate screwed to the horizontal framework. As its shape is clearly shown in Fig. III. it need not be described verbally; 7 is a lever pivoted at 9. A washer serves to keep it the proper distance from the framework; 8 is a spiral spring fastened at one end to the framework and attached to the lever 7; 10 is a screw forming a stop to 7.

We will now return to the rod connected with the conjuror's left arm. This passes through a staple L (shown in Fig. II.), and is pivoted to the curved lever N at M. This lever is pivoted at O, and is furnished with a spring P, the other end of which is secured to the framework.

R is a rest fixed to the upright frame.

The table-cloth and vessel placed upon it are cut out of thin wood and glued to the fixed glass. Two of the legs are outlined on the glass. The third upright leg is formed by a strip of celluloid C which passes through two similar guides A and B, shown in Fig. II. A is fixed to the table and B to the base. At the top of the celluloid is a small rabbit. This strip, with the rabbit, is cut in one piece. It is represented in Fig. II. The lower end of the strip is pivoted to the lever D, which is in turn pivoted to the frame of the slide at E. A slot has to be cut in this instance to allow for the play of the lever. F is a spiral spring secured at one end and connected with D at the other. G is a screw serving as a stop to D. H regulates the distance through which D should be moved. It should have been mentioned that Q serves as a stop to the lever N.

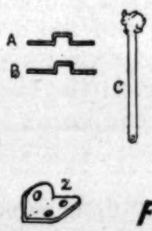


Fig. 2.

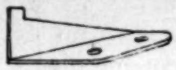


Fig. 3.

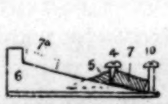


Fig. 4.

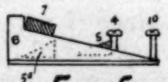


Fig. 5.

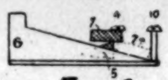


Fig. 6.

Upon the fixed glass are painted the curtains, lamp, etc. that would naturally form the background to the conjuror upon the stage. They are shown in detail in the design forming the heading of this article.

When inserted in the optical lantern, the conjuror is seen holding the cover of the vessel on the table in his left hand, and grasping his wand with his right. The lever N is then pressed up to the rest R. By this means the rod in connection with the lever is pulled down, and the left arm, pivoted at J, and holding the cover, consequently pulled up.

The emptiness of the vessel upon the table is thus revealed. The lever N is then allowed to resume its original position. The rod is pushed up by means of the spring P, and the cover is replaced on the dish.

The lever 7, the end of which presses against the end of the beam 11, is now pressed upwards. As the protruding end rises the other end naturally descends, and pushes with it the beam 11. The perpendicular rod Y is thus forced upwards. Owing to the manner in which they are pivoted, the right arm X swivels round, raising the wand in the air, and the head is thrown back a trifle.

But as the end of the lever 7 falls it slides off the incline on the plate 6, and presently the end 5 of the beam 11 is released and springs back underneath the lever to its original position.

As the beam thus springs back the connecting rod Y is pulled down suddenly, and the arm X falls also—the wand held in the conjuror's hand thus apparently giving the cover on the table a smart rap. At the same time the conjuror's head is thrown down a trifle as it naturally would be in the act of striking.

The lever 7 when released is pulled back by the spring 8 and falls down over the top edge 5 into its original position between 5 and 10. The same performance is again gone through by simply pressing the lever 7 up again, and in this way the conjuror can be made to give the vessel as many taps with his wand as desired.

In order that the reader may thoroughly understand the movements that have just been described, the three Figs. IV., V., and VI. have been given. They represent end views of the parts we have been dealing with.

Fig. IV. shows the position of the lever 7 and inclined edge 5 of the beam 11 previous to their being actuated.

When the lever is moved it slides up the inclined edge of the plate 6, pushing before it the edge of the beam with which it is in contact. Bearing in mind the fact that the beam moves horizontally whilst the lever moves up the incline, it is obvious that there must come a time when the end of the lever will be higher than the top edge of the beam. When that point arrives the beam will be released, and, by means of the spring connected with it, pulled back into its original position. Fig. V. shows this action. 5a indicates the position occupied by the beam just as it is released. 5 represents it in its first position. Then, when the lever 7 is released it is pulled back down the incline, and passing over the top of the beam (see Fig. VI.), drops down into its proper place as shown at 7a.

If he has followed this description carefully with the help of the diagrams, the reader will experience no difficulty in understanding thoroughly the exact action of these important parts of the slide. But let us continue our description of the action of the slide.

After the cover has been struck several times by the magic wand, the lever D is pulled down to the stop H and kept there. The celluloid strip C is thus forced upwards and the rabbit raised above the edge of the vessel on the table. The lever N is now pressed up to the rest R and the cover is thus removed, revealing the rabbit snugly nestling within the dish. After a few moments N is released, the cover is thereby replaced, and G is also allowed to spring back. The rabbit thus drops down again whilst under cover. N is then pressed up, and the vessel shown to be empty—the rabbit having mysteriously appeared to and disappeared from view.

(*To be continued.*)

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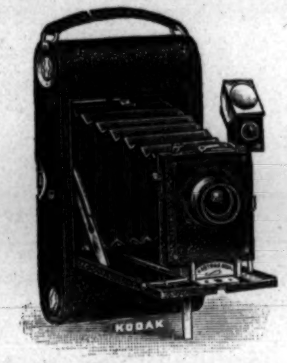
NEW APPARATUS.

NEW KODAKS AND FILM.

Kodak, Limited, are continually adding to their styles of cameras, the latest being the Panoram Kodak and the folding ¼-plate Pocket Kodak. The Panoram takes long narrow pictures 7 by 2¼ inches with a swivelled lens, thus embracing an angle of view of 112. The film is exposed by degrees through a narrow slit which traverses the film, and for this purpose the lens can be actuated to move at two different speeds. The camera is covered in black morocco, and has nickelled fittings.

The No. 3 folding Pocket Kodak, of which we give an illustration, is practically the same as one of a smaller size noticed in our columns some time ago. This, however, takes pictures of the ¼-plate size. It is made for the most part in aluminium, has a R.R. lens, can be loaded in daylight, is replete with all the latest fittings and improvements, yet folds up into very small compass.



Messrs. Kodak, Limited, inform us that at the request of a large number of dealers they have decided to put their paper films on the market in the form of spools. The negatives obtained on these films give good results on Dekko or bromide papers, the effect being soft.

LUMIERE'S PORCELAIN PAPER (PATENT).

Messrs. L. Gaumont & Co., Cecil Court, Charing Cross Road, W.C., are placing this paper upon the market in this country. The principal advantages claimed for it are the extreme beauty of the whites and blacks and the rich gradation of tints. The instructions are as follows:—Expose the negative and paper to gaslight as for ordinary bromide paper, length of exposure varying according to the density of the negative. To develop, plunge the paper first of all for 20 or 30 seconds in pure water, then place face upwards in a dish, and flood the developer over the surface at one sweep. As soon as the image acquires sufficient vigour, which is examined by transparency, it must be quickly washed in plenty of water, then immediately placed in the fixing bath, where it may stay about 10 minutes. The subsequent washing should be for at least three hours in running water. The prints can then be hung up to dry. After a further immersion of 10 minutes they can be mounted.

DEVELOPING BATH.

(To be prepared at the moment of use.)

Water	100 parts or c.c.
Anhydrous sulphite of soda ..	15 parts or grammes.
Dianol (diamidophenol) ..	5 parts or grammes.
5 per cent. solution of bromide potass.	5 to 10 parts or grammes.

FIXING BATH.

Water	1000 parts or c.c.
Hyposulphite of soda ..	200 parts or grammes.
Bisulphite of soda ..	10 parts or c.c.
Ordinary alum	2 parts or grammes.

NEW SLIDES BY YORK AND SON.

The thirty-first annual supplemental catalogue of Messrs. York & Son, the well-known lantern slide producers, of 67, Lancaster Road, Notting Hill, W., has just been published. As usual, it is up to date. It gives particulars of 70 slides of the Paris Exhibition, 50 slides about Holland, 60 of China and the Chinese. The Transvaal in war is a very large section, and is divided into five distinct sets as follows:—1 to 50, 51 to 100, 101 to 150, 151 to 200, 201 to 236; but in a short time this last set will be made up to 50, when set 6 will be commenced. There is also a good and interesting set of 43 slides on Baalbec. Particulars are also given of photographic slides of trees, flowers, etc., blossoms, and hoar frost scenes. As usual, life model sets are to the fore, Off to Klondyke, The Erndales (temperance), Teddy's Button, The Laughter of Fools, and others. Messrs. York's slides are always of the highest class.

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PATENT INTELLIGENCE.

The following List, relating to current Patent Applications, is compiled expressly for the "Optical Magic Lantern Journal" by W. P. Thompson & Co., Patent Agents, of 322, High Holborn, London, W.C., to whom all enquiries for further information should be addressed.

No.	RECENT PATENT APPLICATIONS.
10729.	12th June, 1900. Walter Hauenstein and Daniel Clecner. An improved method of producing pictures in relief. (Complete.)
10781.	13th June, 1900. Richard Pilkington. An optical toy.
10896.	15th June, 1900. William Carter. Cinematograph machine.
10923.	15th June, 1900. Antonio Sauve. Improved apparatus for the projection and superposition of the images of several diapositives by aid of a single objective applicable for colour photography. (Complete.)
10992.	16th June, 1900. Horst Brehm. A new or improved process and apparatus for handling cinematograph and other rolled films.
11213.	20th June, 1900. Antonio Sauve. Improved apparatus for viewing the superposed images of multiple diapositives with colour screens. (Complete.)
11393.	23rd June, 1900. John Lockie. Optical illusion apparatus.
11574.	26th June, 1900. William Hockley. Improvements in mechanism for taking a series of photographs upon a sensitised band of film and for projecting the same.
11745.	28th June, 1900. Philippine Wolff. Improvements in the fixing and guiding of pictures in kinetoscopes. (Complete.)

11873. 30th June, 1900. Alfred Julius Boult. (Karl Kutzbach and Hermann Barkert, Germany.) A process and apparatus for the reproduction or representation of objects in relief or intaglio by the aid of photography.

12113. 4th July, 1900. William Knight Gregory. Improvements in orthoptics or spectacles to facilitate the aiming of rifles and the like.

12181. 5th July, 1900. Frederic Eugene Ives. Improvements in photo-chromoscopic apparatus. (Complete.)

12308. 7th July, 1900. Henry William Short and Herbert Edward Hughes. Improvements in book-form kinetoscopes.

12820. 16th July, 1900. George Frederick Hatton and Alfred North Whitehead. Improvements in apparatus for taking and viewing or exhibiting cinematographic pictures.

12929. 18th July, 1900. John Thomas Wood and James Malin. Improvements in lanterns.

13076. 19th July, 1900. Walter Pelham Warren. Improvements in and relating to apparatus for the production of moving or living pictures.

13317. 24th July, 1900. Sydney Elliot Pages. (The Grenier Art Company, United States.) Improvements in coloured photographs and the process of making them. (Complete.)

Copies of the following specifications may be obtained by remitting 1/- for each specification to W. P. Thompson & Co., Patent Agents, 322, High Holborn, London, W.C.

SPECIFICATIONS PUBLISHED.

15967 of 1899. Kamm. Electric arc projecting lanterns.

12497 of 1899. Edwards. Method and means of changing (either rapidly or otherwise) the sensitive surfaces in taking photographs or for displaying the views in rapid succession in animated photography or the like.

16326 of 1899. Malke. Apparatus for exhibiting "living pictures."

1772 of 1900. Goertz. Focal adjustment for binocular optical instruments.

8991 of 1900. Fulgora. Apparatus for projecting images of opaque pictures and other objects upon screens.

9141 of 1900. Messter. Apparatus or mechanism for the exhibition of animated photographs or pictures.

15480 of 1899. Wray. Coin-freed apparatus for exhibiting series of photographs.

10729 of 1900. Hauenstein and Cleckner. Method of producing pictures in relief.

12515 of 1899 Selle. Manufacture of selective colour light filters for photo optical purposes.

12516 of 1899. Selle. Sensitising and relative sensitive adjustment of photographic plates or the like for use in colour photography, and to the measurement of time exposure of said plates.

12517 of 1899. Selle. Formation of films for use in colour photography.

15693 of 1899. Belbin. Support for focusing cloths and screens for photographic and other lenses.

19843 of 1899. Garchey. Colour photography.

16327 of 1899. Malke. Coin-freed apparatus for exhibiting living pictures.

12181 of 1900. Ives. Photochromoscopic apparatus. (Date applied for under International Convention, March 9th, 1900.)

Notes and Queries.

E. Dunmore.—We note the change.

Sidney B. Cope.—No doubt the toy is very ingenious, but it is not at all in our line. Consult some wholesale toy dealer.

W. O'Hare.—The set of Boer slides you allude to is published by York & Son, 67, Lancaster Road, Notting Hill, W. The slides are 12s. per dozen plain, and 24s. per dozen coloured. Letter sent by this post.

W. Butler.—We shall endeavour to have an article on the subject shortly.

Lister.—The material you enclosed in your letter is the next best thing to an opaque screen.

A. H. Vidler.—The slides marked with a capital "C" with a small "c" inside may be obtained from Messrs. Watson & Son, 313, High Holborn, W.C.

H. writes that he has great difficulty in making a good connection between his automatic gas regulator and cylinder, and that however tightly he screws it in, there is still a leak. He has tried whitelead, putty, and a washer of leather, but cannot overcome his difficulty. *Ans.*—Make a very thin washer of soft lead, leaving, of course, a hole in the centre, and interpose this between the regulator and bottle, screwing up moderately tight; this should mend matters.

N. Pachkovsky (*Russia*).—Messrs. Wrench & Sons address is 50, Grays Inn Road, London, W.C.

J. Downey & Sons.—We are unable to learn that the Kaleidograph is still on the market, but it was only another name for the Kaleidoscope. This latter you can obtain ready for attaching to lantern for about 37s. 6d. through any dealer.

Generator.—We would recommend you to communicate with Mr. R. J. Moss, of Birmingham. Besides being an authority on acetylene generators, he deals in every good make upon the market. State your definite wants, but first read the article by him in this and last journal.

Constant Reader (*Birmingham*).—You give neither name nor address.

NOTICE.

We are requested by the Publishers to announce that as our next number will be a special one to mark the commencement of the season, they intend printing an extra large number of the October journal, and will be pleased to send a copy free by post to anyone interested in lantern work. If any readers have friends, either at home or abroad, to whom they would like a copy sent, will they kindly forward names and addresses as soon as possible.